July 1, 1941. G. B. EMERSON 2,247,486

SHUTTLECOCK

Filed Feb. 24, 1940

Fig. 1

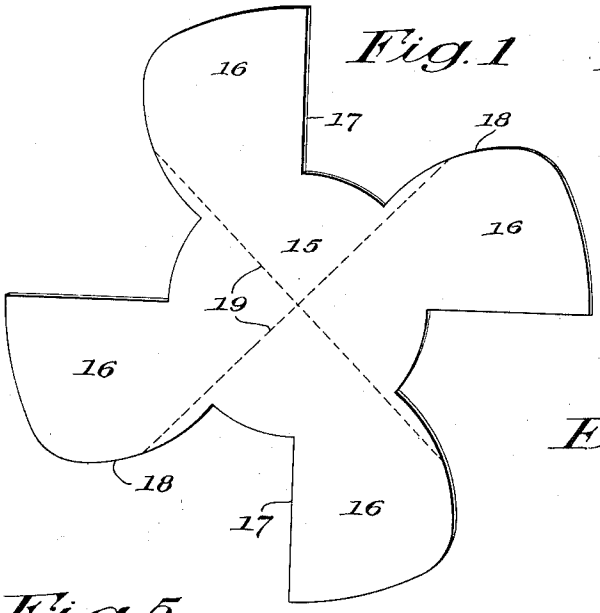


Fig. 2

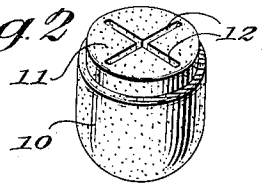


Fig. 3

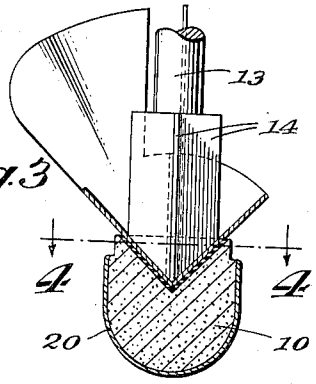


Fig. 5

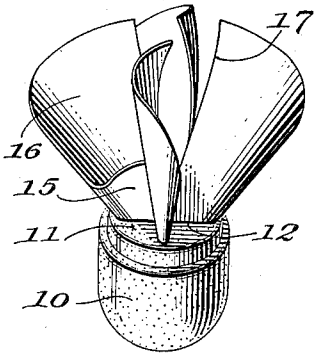


Fig. 4

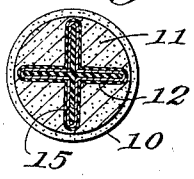


Fig. 6

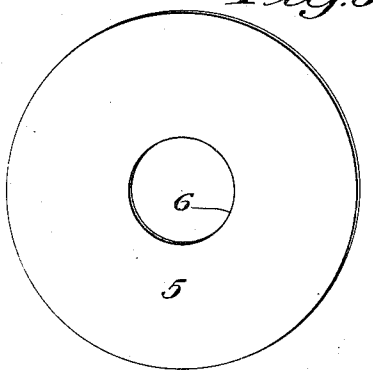


Fig. 8

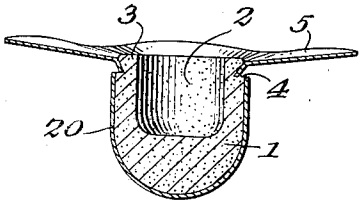


Fig. 9

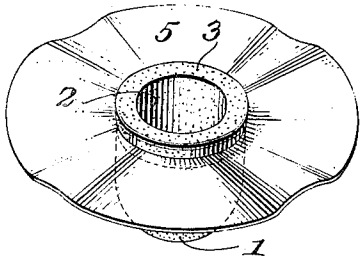
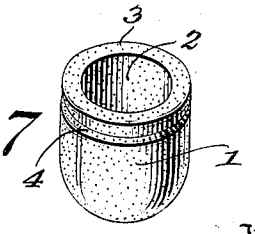


Fig. 7



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2,247,486

SHUTTLECOCK

George B. Emerson, Cambridge, Mass.

Application February 24, 1940, Serial No. 320,679

4 Claims. (Cl. 273—106)

My present invention relates to shuttlecocks for use in playing such games as badminton.

While badminton is an excellent game, the expense of the easily broken or damaged shuttlecocks is an objectionable feature that limits its popularity.

My invention relates to novel shuttlecocks that may have the desired flight characteristics of the present shuttlecock and are both inexpensive to manufacture and durable in use. In accordance with my invention, the flight characteristics of the shuttlecocks may be altered, if desired, to render them adaptable for indoor or outdoor use for standard courts or for use where the playing area is restricted.

In accordance with my invention, a shuttlecock consists of a light weight body to which is attached, rearwardly of its weight center, a skirt of flexible fabric or like light weight material disposed to flare rearwardly sufficiently to control its flight. The skirts may be pleated and the pleats disposed to establish vanes to cause the shuttlecocks to rotate in flight.

In the accompanying drawing, I have shown typical embodiments of my invention from which the many novel features and advantages of my invention will be readily apparent. In the drawing:

Fig. 1 is a plan view of one form of skirt.

Fig. 2 shows a typical body in perspective.

Fig. 3 is a partly sectioned view showing the assembling of a shuttlecock.

Fig. 4 is a sectional view along the lines 4—4 of Fig. 3.

Fig. 5 shows, in perspective, a finished shuttlecock in accordance with my invention.

Fig. 6 shows a modified skirt.

Fig. 7 is a view in perspective of a modified type of body.

Fig. 8 is a sectional view of an assembled shuttlecock including the skirt and body of Figs. 6 and 7 respectively, and

Fig. 9 is a view in perspective of the shuttlecock shown in Fig. 8.

In accordance with my invention, shuttlecocks consist of a light weight body to which I attach rearwardly of its weight center a flexible fabric skirt rearwardly flaring to control the flight of the shuttlecock.

As shown in Figs. 6–9, the shuttlecock may consist of a body 1 that may be formed with an axial bore 2 through its rear face 3. I form the body 1 with an annular groove recess 4 to receive the skirt 5 formed as shown in Fig. 6 with a centrally disposed aperture 6 of lesser diameter than the diameter of the body 1 measured through the groove 4. The skirt 5 is assembled as shown in Fig. 8 and anchored in the groove 4 and against the body 1 rearwardly of the groove 4 as by a suitable cement. As shown in Figs. 8 and 9, the skirt 5, in the completed shuttlecock, is rearwardly flared.

In Figs. 1–5, I have shown a shuttlecock in which the body 10 has in its rear face 11 a pair of slots 12 diametrically disposed to intersect each other at right angles. As shown in Fig. 3, the slots 12 increase in depth towards the axis of the body 10. The function of the slots 12 is to receive portions of the skirt so that it presents pleated flaring flight controlling portions. As shown in Fig. 3, the skirt may be anchored in the slots 12 by a suitable tool 13 having slot centering portions 14. The flare of the flight controlling portions of the skirt as well as the number of pleats are dependent on the depth and the number of the slots in the body 10.

Where rotation of the shuttlecock is desired, I employ a skirt such as the skirt 15 shown in Fig. 1. The skirt 15 is formed with wing portions 16, one edge 17 of which is in diametrical alinement with the edge 17 of the opposite wing portion. The other edge 18 of the wing portions 16 is curved to intersect the indicated lines of fold 19.

In assembling shuttlecocks of the type shown in Figs. 1–5, the skirt 15 is centered on the rear face 11 of the body 10 with the lines of fold 19 in alinement with the slots 12. The skirt 15 is then anchored in the slots 12 with the wing portions 16 being disposed to establish vanes to cause the rotation of the shuttlecock in flight.

If desired, the skirt 15 may be anchored in the slots 12 by cement and the portions of the skirt 15 inwardly of the wings 15 cemented together where added strength and reinforcement is desired.

I have stated that the bodies of shuttlecocks in accordance with my invention are of light weight material. As shown in Figs. 7, 8, and 9, the bodies may be bored to decrease their weight and may be provided with a layer of fabric 20 to deaden the sound of their impact with the floor or to increase the visibility of the shuttlecock in flight.

The skirts may likewise be of any suitable material having sufficient flexibility to retain their shape during use. I have used with good

success such treated fabrics as rubberized silk that are not readily damaged and have the added advantage of being washable. With shuttlecocks of the rotating type, a further advantage of the use of flexible material is that the pleats or wings 16 are subjected to centrifugal force by which their flight controlling action is increased.

Shuttlecocks in accordance with my invention may be made to have a wide range of flight characteristics since by varying the relative size of the skirt and the body, it may be made adaptable to any playing surface.

What I therefore claim and desire to secure by Letters Patent is:

1. A shuttlecock or like game device, said shuttlecock comprising a body having a rear face, said rear face having a pair of diametrically disposed slots intersecting each other at right angles with said slots increasing in depth towards the axis of said body, and a flight controlling flexible fabric skirt having a center, and said skirt being anchored in said slots with its center in registry with the flight axis of said body to present pleated and flaring flight controlling portions.

2. A shuttlecock or like game device, said shuttlecock comprising a body having in its rear face radially disposed slots, and a flexible sheet, said sheet being formed with the same number of tab portions as there are slots, said sheet being anchored in said slots so that each tab is folded to present a flaring pleat, one set of corresponding sides of said pleats being of less area than the other set of sides whereby the shuttlecock is rotated in flight.

3. A shuttlecock or like game device, comprising a body and a flexible sheet anchored to said body and folded upon itself to provide a plurality of flaring pleats, one set of corresponding sides of said pleats being of less area than the other set of sides to rotate the shuttlecock in flight.

4. The structure of claim 3, the sheet being sufficiently flexible so that the air resistance of the pleats is increased by the action of centrifugal force as the shuttlecock rotates to retard its speed of flight.

GEORGE B. EMERSON.